Author: **Subject: Ammonium perchlorate without DIY anodes?**

ecos
National Hazard
posted on 3-9-2015 at 00:03

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

Thanks a lot Nux and Greenlight.

is there any indication to know if the chloride concentration is going down ?

I was thinking about tracking the current consumed by the cell, I think if the chlorate decrease the current intensity will vary and this can be a good indication to stop the cell rather than waiting for fixed amount of time !

I am planning to buy a shunt resistor and insert it in serious with the electrode. I will be able to read the voltage drop on the resistance to know the current passing in the cell.

do you think the idea will work ?

[Edited on 3-9-2015 by ecos]

PROFILE FIND

nux vomica
National Hazard
posted on 3-9-2015 at 01:52

Posts: 265
Registered: 18-7-2013
Member Is Offline

Mood: No Mood

You could use one of these.
http://m.ebay.com/itm/Digital-60V-100A-Battery-Power-Analyzer-Watt-Meter-Balancer-For-DC-RC-Helicopter-/190863796444?nav=SEARCH

PROFILE FIND

ecos
National Hazard
posted on 3-9-2015 at 03:16

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

> **Quote:** **Originally posted by nux vomica**
>
> You could use one of these.
> http://m.ebay.com/itm/Digital-60V-100A-Battery-Power-Analyzer-Watt-Meter-Balancer-For-DC-RC-Helicopter-/190863796444?nav=SEARCH

good tool

so what would be the current value to stop the cell ?

PROFILE FIND

macckone
International Hazard

posted on 3-9-2015 at 06:46

Posts: 1386
Registered: 1-3-2013
Location: Over a mile high
Member Is Offline

Mood: Electrical

> **Quote:** **Originally posted by ecos**
>
> > **Quote:** **Originally posted by nux vomica**
> >
> > You could use one of these.
> > http://m.ebay.com/itm/Digital-60V-100A-Battery-Power-Analyzer-Watt-Meter-Balancer-For-DC-RC-Helicopter-/190863796444?nav=SEARCH
>
> good tool
>
> so what would be the current value to stop the cell ?

You wouldn't use current. You would use amp.hr.
Very cool meter.

PROFILE FIND

ecos
National Hazard

posted on 11-9-2015 at 00:46

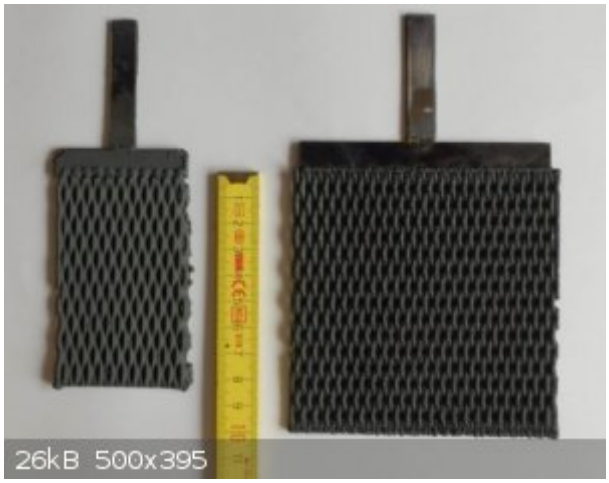
Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

it is very interesting to see 1mm coated PbO2 anode : Link

any reason for this high cost ?

[Edited on 11-9-2015 by ecos]



[Edited on 11-9-2015 by ecos]

PROFILE FIND

greenlight
International Hazard
★★★★★

posted on 11-9-2015 at 05:45

Posts: 620
Registered: 3-11-2014
Member Is Offline

Mood: Energetic

I have seen those too, they would be good in a perc cell and it would take a while to kill them.
I was wondering the same thing, bit expensive.

The only use for an atomic bomb is to keep somebody else from using one.
George Wald

PROFILE FIND

ecos
National Hazard
★★★★

posted on 11-9-2015 at 11:57

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

I think it can be done easily :
https://youtu.be/bZMWEYiTtso

PROFILE FIND

ecos
National Hazard
★★★★

posted on 15-9-2015 at 04:46

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

one of the factors that affect the performance is circulation of the electrolyte. i found that mentioned in this thread.

is it possible to use air bubbler instead of magnetic stirrer ?

PROFILE FIND

ecos
National Hazard
★★★★

posted on 19-9-2015 at 12:15

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

Finally I received my MMO plates. I am waiting for The platinum mesh anode and the lead dioxide anodes 😐

I should connect the dark one to the +ve voltage and the other one to the negative, the question there: what should be the distance between the two plates?

[Edited on 19-9-2015 by ecos]

PROFILE FIND

hyfalcon
International Hazard
posted on 19-9-2015 at 17:11

Posts: 1003
Registered: 29-3-2012
Member Is Offline

Mood: No Mood

Aquarium pump with a piece of tubing run to the bottom of the reaction vessel is all you need. Just needs some turbulence to keep fresh electrolyte moving around the electrodes. This also keeps temperature gradients from being a factor.

As far as distance of the electrodes. This depends on how big your power supply is. How hard are you planning to push them?

[Edited on 20-9-2015 by hyfalcon]

PROFILE FIND

greenlight
International Hazard
posted on 19-9-2015 at 20:55

Posts: 620
Registered: 3-11-2014
Member Is Offline

Mood: Energetic

@Ecos, where did you order your Platinum mesh and Lead dioxide anode from?
I am still looking for the right one.

The only use for an atomic bomb is to keep somebody else from using one.
George Wald

PROFILE FIND

ecos
National Hazard
posted on 20-9-2015 at 02:32

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

> **Quote: Originally posted by greenlight**
>
> @Ecos, where did you order your Platinum mesh and Lead dioxide anode from?
> I am still looking for the right one.

I got the Platinum anode from the link you provided me before : Link

for the Lead dioxide anode : Link

fortunately i took the last piece

PROFILE FIND

ecos
National Hazard
posted on 20-9-2015 at 02:39

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

> **Quote: Originally posted by hyfalcon**
>
> Aquarium pump with a piece of tubing run to the bottom of the reaction vessel is all you need. Just needs some turbulence to keep fresh electrolyte moving around the electrodes. This also keeps temperature gradients from being a factor.
>
> As far as distance of the electrodes. This depends on how big your power supply is. How hard are you planning to push them?
>
> [Edited on 20-9-2015 by hyfalcon]

I am planning to do that using magnetic stirrer since it will make sure all parts of the electrolyte is moving , do you think it would better than air pump ?

I bought a new PC power supply (350 Watt), it can deliver 10A for 5V. I think this would be good for chlorate cell.

putting the electrodes far away from each other will increase the resistance between the electrode and decrease the current flow. is that desired?

PROFILE FIND

hyfalcon
International Hazard
posted on 20-9-2015 at 03:40

Posts: 1003
Registered: 29-3-2012
Member Is Offline

Mood: No Mood

No, closer is better. Further apart and you will overheat the electrolyte. Too close and those flat electrodes could warp and short. I usually used the distance between electrodes to control the temperature.

PROFILE FIND

ecos
National Hazard
posted on 20-9-2015 at 05:42

is there anyway to know the distance so i can have around 8 A current?

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

would 1" distance be fine ?

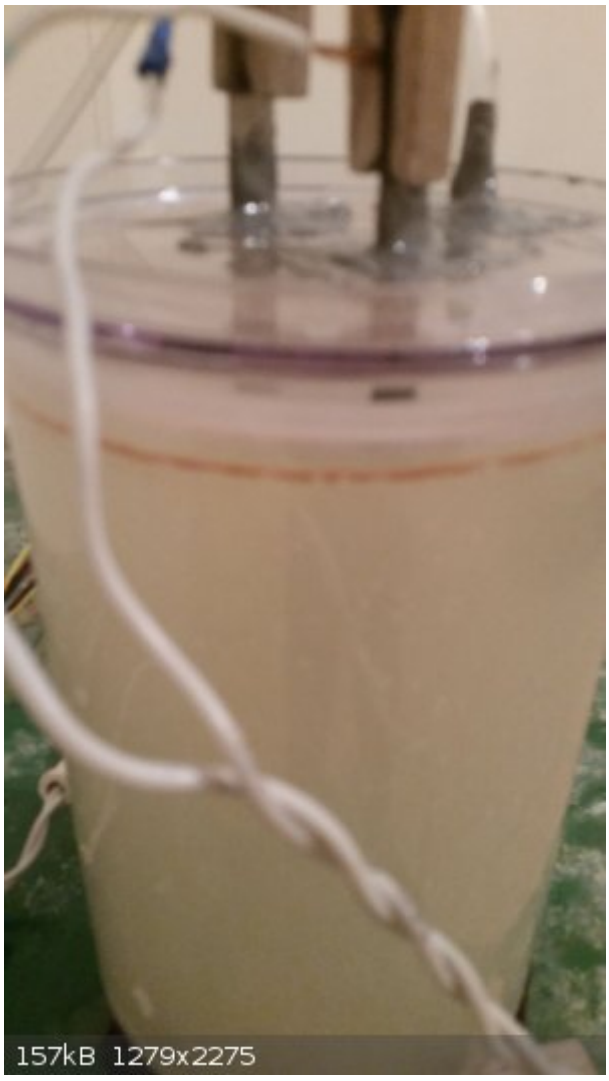
PROFILE FIND

ecos
National Hazard
posted on 2-10-2015 at 15:09

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

I built my chlorate cell and it is operating now.
I started to see the orange colour coming on the surface and near the gas exit.
I started to feel this is not due to corrosion because the electrodes are new and the cell operated for few hours only. I also included pictures for that(the dark surface is epoxy)



any idea why I have this strange orange surface ?

My cell operates at 3A under 5v. I am not satisfied with this current so I tried to get the electrodes as close as much as I can but now it is 4A and the electrodes became hot.

I am thinking to add another SS cathode to increase the current or I can increase the voltage to be 12V. I am not sure which option would be better !

[Edited on 3-10-2015 by ecos]

[Edited on 3-10-2015 by ecos]

PROFILE FIND

hyfalcon
International Hazard
★★★★★

posted on 3-10-2015 at 02:25

Posts: 1003
Registered: 29-3-2012
Member Is Offline

Mood: No Mood

2 smaller cathodes is better than one large one. Better charge distribution.

What are you elctrolysing? NaCl or KCl? If KCl then mag stirring is out. I've had chlorate crystals even try to clog the air tube before. Make sure you've got your air on full force. In larger reaction vessels, crystal mass falling out of solution can cause problems, especially if you try to pump or move your electrolyte out of the temperatures in the main vessel. Tubes freeze solid with chlorate crystals. Can be a mess to clean up.

[Edited on 3-10-2015 by hyfalcon]

PROFILE FIND

ecos
National Hazard
★★★★

posted on 3-10-2015 at 06:02

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

> **Quote:** **Originally posted by hyfalcon**
>
> 2 smaller cathodes is better than one large one. Better charge distribution.
>
> What are you elctrolysing? NaCl or KCl? If KCl then mag stirring is out. I've had chlorate crystals even try to clog the air tube before. Make sure you've got your air on full force. In larger reaction vessels, crystal mass falling out of solution can cause problems, especially if you try to pump or move your electrolyte out of the temperatures in the main vessel. Tubes freeze solid with chlorate crystals. Can be a mess to clean up.
>
> [Edited on 3-10-2015 by hyfalcon]

I have KCl in the electrolyte. I don't use an air pump but I use magnetic stirrer instead.
The magnetic stirrer is 12v computer fan mounted on it a hard disk magnet. It works well.

is there any problems from using mag stirrer?

[Edited on 3-10-2015 by ecos]

PROFILE FIND

hyfalcon
International Hazard
★★★★★

posted on 3-10-2015 at 08:10

Posts: 1003
Registered: 29-3-2012
Member Is Offline

Mood: No Mood

As your electrolysis continues chlorate will fall out and foul your stirrer.

PROFILE FIND

ecos
National Hazard
★★★★

posted on 3-10-2015 at 08:26

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

Ahaa. Good point.
If this is the only reason then i can manage to solve this.
I will buy a small pump and try to connect it.

But would the ciculation of the electolyte disturb the gas formation on the electodes??

PROFILE FIND

ecos
National Hazard
posted on 3-10-2015 at 10:43

please support

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

One day passed and nothing participated in my cell.

this is the procedure I followed.
1- I added 600 gram of KCL to 2.5 liters of tap water (it was normal cold water, I didnt boil)
2- I used PC power supply , I used the 5 v terminal. it supply 3A.
The MMO rode is connected to the +ve terminal , The platinum is connected to the -ve terminal
3- after the electrolyte became warm , I kept adding KCL (another 250 gram were added)
4- I used magnetic stirrer to circulate the electrolyte.
5- I found the voltage of the PC supply dropped to 3.5 v and the current was 5A now.

I use cheap power supply this is maybe the reason the voltage is dropping in it with time.

I measure the PH and it is between 5 and 6. I don't know why it is like this

I can't see any kind of participation till now and I feel disappointed

[Edited on 3-10-2015 by ecos]

[Edited on 3-10-2015 by ecos]

PROFILE FIND

ecos
National Hazard
posted on 4-10-2015 at 03:34

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

After one and half day. I stopped my cell and tried to see if anything would participate but nothing till now.

what concern me is the electrode state, the cathode (platinum) looks darker and has dark region on it ! any reason for that ?

PROFILE FIND

Deathunter88
National Hazard
posted on 4-10-2015 at 05:26

Posts: 403
Registered: 20-2-2015
Location: Beijing,

> **Quote:** **Originally posted by ecos**
>
> I think we have a lot of factors affecting the efficiency of chlorate and

China
Member Is Offline

Mood: No Mood

> perchlorate electrolysis :
> 1- electrode material -- platinum is the best
> 2- PH -- should be around 6.8
> 3- Temperature
> 4- ultraviolet rays affect the synthesis.
> 5- circulation of the electrolyte
> 6- current density
> 7- Pressure
> ..... etc !
>
> wow this amaze me a lot. I thought the process is very easy but now I realized how many details we need to care about to have efficient cell

The process is easy, if you don't mind sacrificing some efficiency. By the looks of it, you haven't done any of this before, so I suggest you just order the electrodes and go for it. Then learn from your mistakes. Once you start you realise that a lot of the things on your list is out of your control and so you have to accept it. Even is difference in efficiency of 50% is not a big deal, seeing as we are amateur chemists. Instead of say running it for 2 days you run it for 4 days, no biggie.

Here is a handy calculator to calculate how long to run your cell.
http://www.vk2zay.net/calculators/?body=chlorates.php

One last thing, I feel that thermal decomposition of chlorate to perchlorate to be faster (although less efficient). I'll leave finding out how to do that as an exercise to not rely on others so much.

PROFILE FIND

ecos
National Hazard
posted on 4-10-2015 at 06:27

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

I already got the electrodes , please check previous posts and pictures.
I also used mag stirrer for electrolyte circulation.
I have HCl for PH control
The temperature was around 50 degrees.

I think i ask for solution of my problem not homework !

PROFILE FIND

ecos
National Hazard
posted on 7-10-2015 at 04:22

Posts: 464
Registered: 6-3-2014
Member Is Offline

Mood: Learning !

I noticed that no chlorine gas is coming out of the tube i mounted on the cover of the cell.
I put the terminal of the tube in water and i cant see any air pupples coming out!
Would the chlorine gass dissolve back in the cell??
When i open the cover of the cell i start to smell chlorine!
Any suggestions?

PROFILE FIND

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» Energetic Materials